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## And Or Not – the system, the body and time

Brian Fay

Essay for the exhibition catalogue *BOOLEAN EXPRESSIONS: Contemporary Art and Mathematical Data*, The Lewis Glucksman Gallery, University College Cork 23 July – 8 November 2015

(Word count **3,018** including title and footnotes)

When I began writing this text, the first thing I searched for was my laptop, not a pen and paper. My choice is probably one many of us would now, for good or bad reason, make. Using the algorithmic properties of spellcheck, thesaurus and dictionaries all housed within the software programme is now for me a given. This decision is not without consequence, as the drafts for this text are no longer materialized. My overworked words are deleted then retyped; the revisions remain invisible. Within the software there may be an archive of these adjustments, but the visual record of this process is no longer evident. There is no worked on sheet of paper, palimpsestically recording all the errors, erasures, hesitations and mis-spellings that show a performance of the thought processes behind this text. No embodied trace sequentially accumulates to act as its own archive. There is just the neutral white document and the blinking cursor. I raise this somewhat ordinary example of how thought and the body become materialized through technological systems, as it is a key strand that runs through the exhibition *Boolean Expressions*.

A constant and necessary tension in art practice has been the relationship between concept and form. This tension is further accentuated when it relates to a highly structured discipline, in this instance mathematics. One that emphasises externalized logic, procedural systems and abstract values, properties that communicate outside the visual language of their manifestation. Such qualities suggest a division between intangible thought processes external to the body, and the more material based realities of the manipulation of substances and objects. However, this binary division is more porous than this outline suggests. In art historical terms the relationship between visual arts and mathematics has been a continuous and attendant one. For example, Gabrielle Gopinath<sup>1</sup> notes that the use of linear perspective since the Renaissance was:

“An attempt to filter the raw material of perception through a

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<sup>1</sup> Gopinath, G. (2004) ‘The double serial life of drawing’ in *Infinite Possibilities Serial Imagery in 20<sup>th</sup> Century Drawings*, pp.37-45, Mass., Davis Museum and Wellesley College.

mathematically derived system of regulation.”

More recently, from 1944 the influential mathematician Max Dehn taught across a number of Art programmes in the renowned American Art School Black Mountain College. His students here included artists Dorothea Rockburne, Cy Twombly and Robert Rauschenberg. Equally, serial and systems based art practices of the 1960's and 1970's with their intention to shift modes of production from the preceding subjective led processes looked to systems technology and cybernetic theory as a means to inform artmaking. Critic Lucy Lippard in her seminal essay and later publication of the same name *Six-Years: the dematerialization of the art object, 1966-1972*<sup>2</sup> identified this shift. Lippard observed that the term dematerialization “emphasizes the thinking process almost exclusively... [and] may result in the object becoming wholly obsolete.” A noted outcome of such works was a removal of the artist's body as having an intrinsic relationship to the work produced, with the concept in Lippard's view being foregrounded. Boris Groys<sup>3</sup> similarly notes that the conditions of art practice do not rely solely on manual production. He suggests that since the works of Marcel Duchamp:

“We do not identify an artwork primarily as an object produced by the manual work of an individual artist in such a way that the traces of this work remain visible or, at least, identifiable in the body of the artwork itself.”

While this is indeed true, as many early conceptual practices also removed manual labour from the conditions of artistic production, there were moments when, for example, drawing facilitated the role of the body and direct trace was a space for the transmission of concepts. Mel Bochner's exhibition *Working Drawings and Other Visible Things on Paper Not Necessarily Meant to Be Viewed as Art*<sup>4</sup> along with his three-part taxonomy for drawing (working, diagrammatic and finished) demonstrated drawings dual capacity to house concept and trace. Perhaps drawing is important here, as its properties of mark and trace act as both an expressive medium and a positivistic device. This property can function as a

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<sup>2</sup> Lippard, L. (1973) *Six Years: The Dematerialization of the Art Object from 1966 to 1972*. New York: Praeger.

<sup>3</sup> Groys, B. (2010) 'Marx After Duchamp, or The Artist's Two Bodies', in *E-flux journal*, 19. [Online] Available at <http://www.e-flux.com/journal/marx-after-duchamp-or-the-artist%E2%80%99s-two-bodies/>.

<sup>4</sup> *Working Drawings and Other Visible Things on Paper Not Necessarily Meant to Be Viewed as Art* was shown at New York's School of Visual Arts Gallery. The show comprised four white plinths each with a single A4 clip folder presenting 100 Xerox copies of artists' studio notes, their working drawings, diagrams, illustrations and fabrication receipts. Collated, Xeroxed and exhibited by Bochner.

reflection on the characteristics and contents of other disciplines. It is also significantly represented in this exhibition, with a wide range of intentions and formal outcomes. As critic Barbara Rose<sup>5</sup> states drawing and the trace “presides over a restoration of the contemplative function to art.” The contemplative and reflective aspect of the mark is also identified in Bochner’s assertion that art does not illustrate ideas but operates as “a reflection upon them.” This is a key statement in relation to the works in *Boolean Expressions*. This ‘reflection upon’ can be seen as informing both the model and process of production, and the choice of media employed when using concepts from mathematical systems.

The dialogue between artworks from a ‘high-conceptual’ moment and contemporary practice is well articulated in this exhibition. Specifically with the presentation of Bochner’s 1970’s diagrammatic studies *Study for Axioms of Associations* alongside Matthew Ritchie’s response to this work in his recent *Logical Flag* series. Bochner’s graphically reduced modest drawings belie the scope of influences and interests, including mathematics, time and space they encompass. Ritchie too collaborates on multi-disciplinary projects, and initially via drawing, houses multiple concepts from science, philosophy and music. Ritchie’s interest in the hand made diagram as a modest form of distilling information is also part of his curatorial interests, as seen in his *The Temptation of the Diagram* group exhibition at the Andrea Rosen Gallery. However visually reduced the drawing might be, Ritchie’s ambition for the operations of the diagram is considerable. He convincingly suggests that the diagram is “a trace of our collective efforts to articulate and negotiate an almost impossible circumstance: reality itself.”<sup>6</sup> That they further have the ability to act as sites for competing states of ‘prediction, memory, fantasy, language, metaphor and instruction.”<sup>7</sup>

Operating from different area of the same terrain is the understated engagement of the diagram as evidenced in Lynn Woods Turner’s *Untitled* series of delicate pencil drawings on parchment paper. These intimate drawings command a real presence as the slow methodical manual act of repetitive marks develop into

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<sup>5</sup> Rose, B. (1976) *Drawing Now*, New York: Museum of Modern Art. This catalogue accompanied the exhibition *Drawing Now* held at the Museum of Modern Art, p9.

<sup>6</sup> As quoted from an excerpt of his catalogue essay for *The Temptation of the Diagram*, an exhibition at the Andrea Rosen Gallery 2013. [Online] Available at: [http://www.andrearosengallery.com/exhibitions/the-temptation-of-the-diagram-organized-by-matthew-ritchie\\_2013-03-30/3](http://www.andrearosengallery.com/exhibitions/the-temptation-of-the-diagram-organized-by-matthew-ritchie_2013-03-30/3)

<sup>7</sup> Ibid.

geometrical shapes. The delicacy of the hand moving across the paper has an elegant yet provisional quality, as if the drawings could be alluding to another form or future state. The artist body in this case is evidenced through the intimate indexical marks that remain on the surface. This physicality of production and trace is perhaps more pronounced in Aisling O'Beirn's work, *Boolean Logic*. In this three-part piece O'Beirn employs a systems based algebraic logic to the process of building a construction using salvaged timber, to the documenting of her thought processes in a large-scale notational drawing, to a stop motion film of her production of the work. Each element can be understood as a direct engagement with a mathematical problem that is then worked through to a manifestation in which we are invited to witness its own construction. Through her large-scale drawing, reading as a mathematical diary-like notational system, we might almost reenact the sequential decisions and revisions that informed the beautifully balanced construction of this three dimensional piece.

This diary like recording of oneself in time is central to the encyclopedic quality of Hanne Darboven's work. Her drawings suggest a dialogue between the handwritten notational impulse to record, and the highly systematic taxonomies of organizing this information. For Darboven a single work might encompass hundreds of sheets of paper filled with almost illegible markings and notations, which contribute to a highly idiosyncratic yet thorough method of recording her daily activities and experiences. The work in this show is emblematic of this sequential characteristic, with *Kalendar 94 postum op 42 opp A B C D*, presenting 192 separate sheets housed in a sequence of 12 large frames. Each piece presents a series of indexical marks, recording and archiving the passing of time. Darboven's use of numbering is important, but as writer and curator Katharine Stout<sup>8</sup> points out she was not only "interested in the meaning of mathematics or language..." but used them also as elements that could also be worked into other systems, sometimes even as the basis for musical compositions. While framed within rigid structures her marks can function as autographic records of a systematic action, hovering between a twin status of communicative signifier and abstracted trace. It is the hand-done quality of these works that attest to the human experience within a coded taxonomical system.

Similarly, Aram Bartholl's series *Are You Human?* directly questions where the body now resides in relation to digital systems and technologies. The Captcha codes, which are digital algorithmically derived letters and numbers we must recognise and input to prove that we are human, to access online services are

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<sup>8</sup> Stout, K. (2014) *Contemporary Drawing from the 1960's to Now*. London: Tate Publishing, p.57.

materialized by Bartholl as three dimensional text pieces. In so doing he highlights the new technological dynamic, that we now must prove to the software that we are human, a Turing test in reverse of sorts. This work is part of Bartholl's wider interest in the relationship of computer technology to humans, and the materialization of digital entities into the real world. He has shown works from this series in urban environments, equating them to the Tag system of urban graffiti. A form of graphic notation whose coded nuances are known only to a few individuals within a wider public. In so doing he invites the ambiguity and misreading's of two coded languages.

The wall drawing of Sol Lewitt, which is installed during the run of this exhibition can be seen in the context of this essay, as a cross over between the positioning of the artists body in the production of the artwork, and of the artwork unfolding over time. LeWitt's geometrical wall drawings, alluding to mathematical equations and architectural specifications, were originally devised by the artist to be drawn directly on to the surfaces of particular spaces. The original drawings were scaled and mapped onto the actual space and then manually realized by an installation team over extended periods of time. The marks of the original drawing are reenacted, rather than directly transcribed by this team. Through this somewhat open process a small level of programme chance within the installation stage allows for the work to alter, within the rigours of its own system. Importantly each work was conceived as a temporary work, being painted over when the exhibition ended. In this context LeWitt was the generator of the work, yet he did not manually produce it. The work was produced by the hand of others in a secondary position responding to the system of the original producer. The corollary between the time and care involved in the installation of the work and its brief realization and existence as a specific artwork, is pronounced. This asymmetrical relationship points to an understanding of the work not being just a linear form of chronological time, but of experienced time – duration. LeWitt's pieces emerge from an earlier two-dimensional drawing, are then translated to the specific space of its installation, is experienced as a work there, then when subsequently removed the artwork reverts back to its original manifestation as a two dimensional drawing. In this respect the work avoids a direct entropic existence, being an entity that is subject to the action of time passing and material degradation. The multi-temporal properties of this work are not just a sequential marking and counting of time, rather it operates in a richer, plural and more complex state.

Equally, the works in *Boolean Expressions* that both use and depict numbers

point away from solely embodying a form of visual counting, and as previously mentioned allude to the temporal status of duration. Duration in this context is a continuous multiplicity of non-linear temporal successions. As writer David Couzens Hoy<sup>9</sup> suggests, the succession of duration can be characterised as “the idea that time is stretched out and not a series of atomistic nows.” Duration is therefore a non-spatial and non-divisible form of time. As such it allows time to be understood as a richer qualitative consciousness of simultaneous temporalities, as opposed to one of just counting.

John Gerrard’s three-screen work *Exercise (Dunhuang)* literally progresses over time, both clock time and durational time. This piece employs computer software to virtually depict a real site in China that appears to play out like a computer game. 38 characters, based on real Chinese workers, move through a maze like landscape. This system is governed by a set of rules set by Gerrard. When a character encounters another character the one who has travelled furthest up to that point wins, and the other must sit down. The work plays out over 365 days, within which each game takes 3 days to complete. When a ‘winner’ emerges from these encounters the system algorithmically resets and begins again, but importantly will never repeat in the same way. The tempo of the piece is slow and while to some extent it acknowledges a real time temporal status, our experience and pacing of the work is slowed down to observe nuances and details of these algorithmic derived encounters. Yet it is not slowed enough to allow us to watch the entire programmed piece, which remains temporally as a continuous open-ended present.

Numbers and counting, with their properties of demarcation and division are employed by us to locate our shared position in time. While there are many origin stories of the nature of our 60-minute hour, one of the most persuasive is that these numbers were chosen as they related mathematically to the 360-degree designation of the circle. 60 is then a number that has a relationship to the circle and can be divided by the most numbers, 2, 3, 4, 5, 6, 10 etc., therefore on the basis of it being a mathematically elegant and a beautiful solution, it was taken as the measure for our documentation of counting time. But the measurement of clock time is simply a quantitative activity that does not take account of our qualitative lived experience of the complexity of time as duration.

Darren Almond’s paintings act as a meditative and reflective experience of time and duration. In his series *Chance Encounter* and *Stream* there is space provided

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<sup>9</sup> Couzens Hoy, D. (2012) *The Time of Our Lives*. Cambridge, Mass.: MIT Press, p.119.

for chance and non-linear sequences to temporally co-exist within the paintings panels. The graphic iconography of the numbers refers to the display numbers on the flip-style formats of older digital clocks. Each number in the sequences of smaller squares within the larger rectangle are cut horizontally across, and do not sequentially correspond to those around them. The all over activity of their sequencing seems to disperse and fragment our model of counting time, suggesting perhaps that this is not an adequate framework to attempt such a difficult quantitative task. In a similar way Tatsuo Miyajima's elegantly formed LED wall works disperse a digital numbering sequence that disrupt the expectation of linear numerical sequencing. Through their mesmeric and delicate pulsing our eye is brought around his geometric and organic structures, seeking out relationships between one flashing point to the next. Each of these points is connected in a complex and multi-temporal manner that denies a single narrative reading. They extend Miyajima's interest in technology as a form of depicting temporal continuity and connections. As he succinctly states "Time connects everything."

In concluding this text I am mindful of my initial example of the distancing of trace from the maker and the object or surfaces that are worked on. A reductivist reading might suggest that the body is also a system of potentials for production, with outcomes defined through factors such as personal experience, autobiography, historical moment, education, individual psychology etc. Similarly the parameters around which an algorithm works might be seen to produce no more than the sets of variables that its Boolean derived software will dictate. But perhaps the potential between visual art and mathematics provides a greater dialogue than this reductivist view might suggest. It is a relationship where we discern overlaps that point to a richer purpose; a search for certain forms of truth, a working out of propositions and suppositions, a testing, a questioning, a performance of thoughts. I note the language that is employed to explain mathematical decisions and scientific testing is frequently taken from the visual. As the physicist Frank Wilczek<sup>10</sup> recently stated that when minutiae of the subatomic world is being examined:

"We don't have much intuition. Aesthetics is one of our only guides... the way we have made progress... is by guessing what the laws should be, on the basis that they should be conceptually beautiful... and then we check them."

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<sup>10</sup> From BBC Radio Four *Start the Week*, 'Harmony and Balance', broadcast July 2015. [Online] Available at: [www.bbc.co.uk/programmes/b060z4pk](http://www.bbc.co.uk/programmes/b060z4pk)



To this end the dynamic of a linear objectivity merges with a more abstracted property of thinking into being. With both disciplines co-existing in a state of emergence that might equally share Boole's indeterminate mathematical values and be 'and, or, not' simultaneously, and emerging the richer for this dialogue.